

What is claimed is:

1. A CDMA base station, which receives a transmission state control command from a mobile station via an up-link so as to make a receiving state of a down-link good in the mobile station and which controls a transmission state of the CDMA base station having not less than two transmission antennas on the basis of the transmission state control command, comprising:

a receiving portion which receives a signal from said up-link;

an up-link transmission line state estimation portion which estimates the transmission line state of said up-link with the transmission antenna of said mobile station from said received signal;

a down-link transmission line state estimation portion which estimates the transmission line state of said down-link from said received signal;

a transmission state control portion which controls the transmission state of said CDMA base station on the base of said transmission state control command taken from said received signal, the transmission line state of said estimated up-link and the transmission state of said estimated down-link transmission line state estimation; and

a transmission portion which performs transmission processing in a transmission state instructed from said transmission state control portion.

2. The CDMA base station according to claim 1, wherein said up-link transmission state estimation portion estimates the

transmission line state of said up-link from a level of said received signal.

3. The CDMA base station according to claim 1, wherein said up-link transmission line state estimation portion estimates
5 the transmission line state of said up-link from SIR of the data obtained by demodulating said received signal.

4. The CDMA base station according to claim 1, wherein said up-link transmission line state estimation portion estimates the transmission line state of said up-link from BER of the data
10 obtained by demodulating said received signal.

5. The CDMA base station according to claim 1, wherein said up-link transmission line state estimation portion estimates the transmission line state of said up-link from FER of the data obtained by demodulating said received signal.

15 6. The CDMA base station according to claim 1, wherein said up-link transmission line state estimation portion estimates the transmission line state of said up-link from a level of the transmission line estimate value of said received signal.

20 7. The CDMA base station according to claim 1, wherein said down-link transmission line state estimation portion estimates the transmission line state of said down-link from

a transmitted power control command column which is contained in said received signal.

8. The CDMA base station according to claim 1, wherein said transmission state control portion does not follow said

5 transmission state control command sent by said up-link when the transmission line state of said up-link is bad or the transmission line state of said down-link is bad, but performs the control so as to transmit by the transmission antenna having a good characteristic of said up-link and, when the transmission
10 line state of said up-link is good and, moreover, the transmission line state of said down-link is good, performs the control so as to follow said transmission state control command by said up-link.

9. The CDMA base station according to claim 1, wherein said

15 transmission state control portion does not follow said transmission state control command sent by said up-link when the transmission line state of said up-link is bad or the transmission line state of said down-link is bad, but performs the control so as to transmit in a specific transmission state
20 and,

when the transmission line state of said up-link is good and, moreover, the transmission line state of said down-link is good, performs the control so as to follow said transmission state control command by said up-link.

10. A transmission diversity control method, which transmits a transmission state control command from a mobile station via an up-link in order to improve a receiving state of a down-link in said mobile station and which controls the transmission state of a base station having not less than two transmission antennas on the basis of the transmission state control command, comprising the steps of:

receiving a signal from said up-link;

estimating the transmission line state of said up-link with the transmission antenna of said mobile station from said received signal;

estimating the transmission line state of said down-link from said received signal; and

controlling the transmission state of said base station from said transmission state control command taken from said received signal, the transmission line state of said estimated up-link and said estimated down-link transmission line state.

11. The transmission diversity control method according to claim 10, wherein the step of estimating the transmission line state of said up-link estimates the transmission line state of said up-link from a level of said received signal.

12. The transmission diversity control method according to claim 10, wherein the step of estimating the transmission line state of said up-link estimates the transmission line state of said up-link from SIR of the data obtained by demodulating said received signal.

13. The transmission diversity control method according to claim 10, wherein the step of estimating the transmission line state of said up-link estimates the transmission line state of said up-link from BER of the data obtained by demodulating said
5 received signal.

14. The transmission diversity control method according to claim 10, wherein the step of estimating the transmission line state of said up-link estimates the transmission line state of said up-link from FER of the data obtained by demodulating said
10 received signal.

15. The transmission diversity control method according to claim 10, wherein the step of estimating the transmission line state of said up-link estimates the transmission line state of said up-link from a level of the transmission line estimate value
15 of said received signal.

16. The transmission diversity control method according to claim 10, wherein the step of estimating the transmission line state of said down-link estimates the transmission line state of said down-link from the transmitted power control command
20 column included in said received signal.

17. The transmission diversity control method according to claim 10, wherein the step of controlling said transmission state does not follow said transmission state control command sent

by said up-link when the transmission line state of said up-link is bad or the transmission line state of said down-link is bad and performs the control so as to transmit by the transmission antenna having a good characteristic of said up-link and, when
5 the transmission line state of said up-link is good and, moreover, the transmission line state of said down-link is good, performs the control so as to follow said transmission state control command sent by said up-link.

18. The transmission diversity control method according to
10 claim 10, wherein the step of controlling said transmission state does not follow said transmission state control command sent by said up-link when the transmission line state of said up-link is bad or the transmission line state of said down-link is bad and performs the control so as to transmit in a specific
15 transmission state and, when the transmission line state of said up-link is good and, moreover, the transmission line state of said down-link is good, performs the control so as to follow said transmission state control command sent by said up-link.